

SEQUENCE LISTING

<110> Ruben, Steven M.
Jimenez, Pablo
Duan, D. Roxanne
Rampy, Mark A.
Mendrick, Donna
Zhang, Jun
Ni, Jian
Moore, Paul A.
Coleman, Timothy A.
Gruber, Joachim R.
Dillon, Patrick J.
Gentz, Reiner L.

<120> Keratinocyte Growth Factor-2

<130> 1488.0360000

<140>

<141>

<150> 60/259,853

<151> 2001-01-05

<150> 60/286,368

<151> 2001-04-26

<150> 60/331,168

<151> 2001-11-09

<160> 176

<170> PatentIn Ver. 2.1

<210> 1

<211> 627

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)..(624)

<400> 1

atg	tgg	aaa	tgg	ata	ctg	aca	cat	tgt	gcc	tca	gcc	ttt	ccc	cac	ctg	48
Met	Trp	Lys	Trp	Ile	Leu	Thr	His	Cys	Ala	Ser	Ala	Phe	Pro	His	Leu	
1				5					10					15		

ccc	ggc	tgc	tgc	tgc	tgc	tgc	ttt	ttg	ttg	ctg	ttc	ttg	gtg	tct	tcc	96
Pro	Gly	Cys	Cys	Cys	Cys	Cys	Phe	Leu	Leu	Leu	Phe	Leu	Val	Ser	Ser	
		20						25					30			

gtc	cct	gtc	acc	tgc	caa	gcc	ctt	ggc	cag	gac	atg	gtg	tca	cca	gag	144
Val	Pro	Val	Thr	Cys	Gln	Ala	Leu	Gly	Gln	Asp	Met	Val	Val	Ser	Glu	
		35					40					45				

gcc	acc	aac	tct	tct	tcc	tcc	tcc	tcc	tcc	tct	cct	tcc	agc	gag	gga	192
Ala	Thr	Asn	Ser	Ser	Ser	Ser	Ser	Phe	Ser	Ser	Pro	Ser	Ser	Ala	Gly	

1003612.010400

50					55					60										
agg	cat	gtg	cgg	agc	tac	aat	cac	ctt	caa	gga	gat	gtc	cgc	tgg	aga	240				
Arg	His	Val	Arg	Ser	Tyr	Asn	His	Leu	Gln	Gly	Asp	Val	Arg	Trp	Arg					
65					70					75					80					
aag	cta	ttc	tct	ttc	acc	aag	tac	ttt	ctc	aag	att	gag	aag	aac	ggg	288				
Lys	Leu	Phe	Ser	Phe	Thr	Lys	Tyr	Phe	Leu	Lys	Ile	Glu	Lys	Asn	Gly					
				85					90					95						
aag	gtc	agc	ggg	acc	aag	aag	gag	aac	tgc	ccg	tac	agc	atc	ctg	gag	336				
Lys	Val	Ser	Gly	Thr	Lys	Lys	Glu	Asn	Cys	Pro	Tyr	Ser	Ile	Leu	Glu					
			100					105					110							
ata	aca	tca	gta	gaa	atc	gga	gtt	gtt	gcc	gtc	aaa	gcc	att	aac	agc	384				
Ile	Thr	Ser	Val	Glu	Ile	Gly	Val	Val	Ala	Val	Lys	Ala	Ile	Asn	Ser					
			115				120					125								
aac	tat	tac	tta	gcc	atg	aac	aag	aag	ggg	aaa	ctc	tat	ggc	tca	aaa	432				
Asn	Tyr	Tyr	Leu	Ala	Met	Asn	Lys	Lys	Gly	Lys	Leu	Tyr	Gly	Ser	Lys					
			130			135					140									
gaa	ttt	aac	aat	gac	tgt	aag	ctg	aag	gag	agg	ata	gag	gaa	aat	gga	480				
Glu	Phe	Asn	Asn	Asp	Cys	Lys	Leu	Lys	Glu	Arg	Ile	Glu	Glu	Asn	Gly					
145				150						155					160					
tac	aat	acc	tat	gca	tca	ttt	aac	tgg	cag	cat	aat	ggg	agg	caa	atg	528				
Tyr	Asn	Thr	Tyr	Ala	Ser	Phe	Asn	Trp	Gln	His	Asn	Gly	Arg	Gln	Met					
				165					170					175						
tat	gtg	gca	ttg	aat	gga	aaa	gga	gct	cca	agg	aga	gga	cag	aaa	aca	576				
Tyr	Val	Ala	Leu	Asn	Gly	Lys	Gly	Ala	Pro	Arg	Arg	Gly	Gln	Lys	Thr					
			180					185					190							
cga	agg	aaa	aac	acc	tct	gct	cac	ttt	ctt	cca	atg	gtg	gta	cac	tca	624				
Arg	Arg	Lys	Asn	Thr	Ser	Ala	His	Phe	Leu	Pro	Met	Val	Val	His	Ser					
		195					200					205								
tag																627				
<210> 2																				
<211> 208																				
<212> PRT																				
<213> Homo sapiens																				
<400> 2																				
Met	Trp	Lys	Trp	Ile	Leu	Thr	His	Cys	Ala	Ser	Ala	Phe	Pro	His	Leu					
1				5					10					15						
Pro	Gly	Cys	Cys	Cys	Cys	Cys	Phe	Leu	Leu	Leu	Phe	Leu	Val	Ser	Ser					
			20					25					30							
Val	Pro	Val	Thr	Cys	Gln	Ala	Leu	Gly	Gln	Asp	Met	Val	Ser	Pro	Glu					
			35				40					45								
Ala	Thr	Asn	Ser	Ser	Ser	Ser	Ser	Phe	Ser	Ser	Pro	Ser	Ser	Ala	Gly					
			50				55					60								
Arg	His	Val	Arg	Ser	Tyr	Asn	His	Leu	Gln	Gly	Asp	Val	Arg	Trp	Arg					
65																				

Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly
85 90 95

Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu
100 105 110

Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser
115 120 125

Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys
130 135 140

Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly
145 150 155 160

Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met
165 170 175

Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr
180 185 190

Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
195 200 205

<210> 3
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 3
ccccacatgt ggaaatggat actgacacat tgtgcc

36

<210> 4
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 4
cccaagcttc cacaaacggt gccttcctct atgag

35

<210> 5
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 5

204070-212500

catgccatgg cgtgcccaagc ccttggtcag gacatg 36

<210> 6
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 6
cccaagcttc cacaaacgtt gccttcctct atgag 35

<210> 7
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 7
gcgggatccg ccatcatgtg gaaatggata ctcac 35

<210> 8
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 8
gcgcggtacc acaaacgttg ccttcct 27

<210> 9
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 9
taacgaggat ccgcatcat gtggaaatgg atactgacac 40

<210> 10
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:

204070"2725001

oligonucleotide

<400> 10
taagcactcg agtgagtgtg ccaccattgg aagaaatg 38

<210> 11
<211> 54
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 11
attaaccctc actaaaggga ggccatgtgg aaatggatac tgacacattg tgcc 54

<210> 12
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 12
cccaagcttc cacaaacgtt gccttctct atgag 35

<210> 13
<211> 206
<212> PRT
<213> Homo sapiens

<400> 13
Met Ser Gly Pro Gly Thr Ala Ala Val Ala Leu Leu Pro Ala Val Leu
1 5 10 15
Leu Ala Leu Leu Ala Pro Trp Ala Gly Arg Gly Gly Ala Ala Ala Pro
20 25 30
Thr Ala Pro Asn Gly Thr Leu Glu Ala Glu Leu Glu Arg Arg Trp Glu
35 40 45
Ser Leu Val Ala Leu Ser Leu Ala Arg Leu Pro Val Ala Ala Gln Pro
50 55 60
Lys Glu Ala Ala Val Gln Ser Gly Ala Gly Asp Tyr Leu Leu Gly Ile
65 70 75 80
Lys Arg Leu Arg Arg Leu Tyr Cys Asn Val Gly Ile Gly Phe His Leu
85 90 95
Gln Ala Leu Pro Asp Gly Arg Ile Gly Gly Ala His Ala Asp Thr Arg
100 105 110
Asp Ser Leu Leu Glu Leu Ser Pro Val Glu Arg Gly Val Val Ser Ile
115 120 125

1003331 010400

Phe Gly Val Ala Ser Arg Phe Phe Val Ala Met Ser Ser Lys Gly Lys
 130 135 140
 Leu Tyr Gly Ser Pro Phe Phe Thr Asp Glu Cys Thr Phe Lys Glu Ile
 145 150 155 160
 Leu Leu Pro Asn Asn Tyr Asn Ala Tyr Glu Ser Tyr Lys Tyr Pro Gly
 165 170 175
 Met Phe Ile Ala Leu Ser Lys Asn Gly Lys Thr Lys Lys Gly Asn Arg
 180 185 190
 Val Ser Pro Thr Met Lys Val Thr His Phe Leu Pro Arg Leu
 195 200 205

<210> 14
 <211> 198
 <212> PRT
 <213> Homo sapiens

<400> 14
 Met Ser Arg Gly Ala Gly Arg Leu Gln Gly Thr Leu Trp Ala Leu Val
 1 5 10 15
 Phe Leu Gly Ile Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Thr
 20 25 30
 Arg Ala Asn Asn Thr Leu Leu Asp Ser Arg Gly Trp Gly Thr Leu Leu
 35 40 45
 Ser Arg Ser Arg Ala Gly Leu Ala Gly Glu Ile Ala Gly Val Asn Trp
 50 55 60
 Glu Ser Gly Tyr Leu Val Gly Ile Lys Arg Gln Arg Arg Leu Tyr Cys
 65 70 75 80
 Asn Val Gly Ile Gly Phe His Leu Gln Val Leu Pro Asp Gly Arg Ile
 85 90 95
 Ser Gly Thr His Glu Glu Asn Pro Tyr Ser Leu Leu Glu Ile Ser Thr
 100 105 110
 Val Glu Arg Gly Val Val Ser Leu Phe Gly Val Arg Ser Ala Leu Phe
 115 120 125
 Val Ala Met Asn Ser Lys Gly Arg Leu Tyr Ala Thr Pro Ser Phe Gln
 130 135 140
 Glu Glu Cys Lys Phe Arg Glu Thr Leu Leu Pro Asn Asn Tyr Asn Ala
 145 150 155 160
 Tyr Glu Ser Asp Leu Tyr Gln Gly Thr Tyr Ile Ala Leu Ser Lys Tyr
 165 170 175
 Gly Arg Val Lys Arg Gly Ser Lys Val Ser Pro Ile Met Thr Val Thr
 180 185 190
 His Phe Leu Pro Arg Ile
 195

204070"223000

<210> 15
 <211> 268
 <212> PRT
 <213> Homo sapiens

<400> 15
 Met Ser Leu Ser Phe Leu Leu Leu Leu Phe Phe Ser His Leu Ile Leu
 1 5 10 15
 Ser Ala Trp Ala His Gly Glu Lys Arg Leu Ala Pro Lys Gly Gln Pro
 20 25 30
 Gly Pro Ala Ala Thr Asp Arg Asn Pro Arg Gly Ser Ser Ser Arg Gln
 35 40 45
 Ser Ser Ser Ser Ala Met Ser Ser Ser Ser Ala Ser Ser Ser Pro Ala
 50 55 60
 Ala Ser Leu Gly Ser Gln Gly Ser Gly Leu Glu Gln Ser Ser Phe Gln
 65 70 75 80
 Trp Ser Pro Ser Gly Arg Arg Thr Gly Ser Leu Tyr Cys Arg Val Gly
 85 90 95
 Ile Gly Phe His Leu Gln Ile Tyr Pro Asp Gly Lys Val Asn Gly Ser
 100 105 110
 His Glu Ala Asn Met Leu Ser Val Leu Glu Ile Phe Ala Val Ser Gln
 115 120 125
 Gly Ile Val Gly Ile Arg Gly Val Phe Ser Asn Lys Phe Leu Ala Met
 130 135 140
 Ser Lys Lys Gly Lys Leu His Ala Ser Ala Lys Phe Thr Asp Asp Cys
 145 150 155 160
 Lys Phe Arg Glu Arg Phe Gln Glu Asn Ser Tyr Asn Thr Tyr Ala Ser
 165 170 175
 Ala Ile His Arg Thr Glu Lys Thr Gly Arg Glu Trp Tyr Val Ala Leu
 180 185 190
 Asn Lys Arg Gly Lys Ala Lys Arg Gly Cys Ser Pro Arg Val Lys Pro
 195 200 205
 Gln His Ile Ser Thr His Phe Leu Pro Arg Phe Lys Gln Ser Glu Gln
 210 215 220
 Pro Glu Leu Ser Phe Thr Val Thr Val Pro Glu Lys Lys Asn Pro Pro
 225 230 235 240
 Ser Pro Ile Lys Ser Lys Ile Pro Leu Ser Ala Pro Arg Lys Asn Thr
 245 250 255
 Asn Ser Val Lys Tyr Arg Leu Lys Phe Arg Phe Gly
 260 265

<210> 16
 <211> 155
 <212> PRT
 <213> Homo sapiens

10035212-010432

<400> 16

Met Ala Glu Gly Glu Ile Thr Thr Phe Thr Ala Leu Thr Glu Lys Phe
 1 5 10 15
 Asn Leu Pro Pro Gly Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser
 20 25 30
 Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly
 35 40 45
 Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu
 50 55 60
 Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu
 65 70 75 80
 Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu
 85 90 95
 Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr
 100 105 110
 Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys
 115 120 125
 Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala
 130 135 140
 Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp
 145 150 155

<210> 17

<211> 155

<212> PRT

<213> Homo sapiens

<400> 17

Met Ala Ala Gly Ser Ile Thr Thr Leu Pro Ala Leu Pro Glu Asp Gly
 1 5 10 15
 Gly Ser Gly Ala Phe Pro Pro Gly His Phe Lys Asp Pro Lys Arg Leu
 20 25 30
 Tyr Cys Lys Asn Gly Gly Phe Phe Leu Arg Ile His Pro Asp Gly Arg
 35 40 45
 Val Asp Gly Val Arg Glu Lys Ser Asp Pro His Ile Lys Leu Gln Leu
 50 55 60
 Gln Ala Glu Glu Arg Gly Val Val Ser Ile Lys Gly Val Cys Ala Asn
 65 70 75 80
 Arg Tyr Leu Ala Met Lys Glu Asp Gly Arg Leu Leu Ala Ser Lys Cys
 85 90 95
 Val Thr Asp Glu Cys Phe Phe Phe Glu Arg Leu Glu Ser Asn Asn Tyr
 100 105 110
 Asn Thr Tyr Arg Ser Arg Lys Tyr Thr Ser Trp Tyr Val Ala Leu Lys
 115 120 125

10035512 010403

Arg Thr Gly Gln Tyr Lys Leu Gly Ser Lys Thr Gly Pro Gly Gln Lys
130 135 140

Ala Ile Leu Phe Leu Pro Met Ser Ala Lys Ser
145 150 155

<210> 18
<211> 208
<212> PRT
<213> Homo sapiens

<400> 18
Met Ala Pro Leu Gly Glu Val Gly Asn Tyr Phe Gly Val Gln Asp Ala
1 5 10 15

Val Pro Phe Gly Asn Val Pro Val Leu Pro Val Asp Ser Pro Val Leu
20 25 30

Leu Ser Asp His Leu Gly Gln Ser Glu Ala Gly Gly Leu Pro Arg Gly
35 40 45

Pro Ala Val Thr Asp Leu Asp His Leu Lys Gly Ile Leu Arg Arg Arg
50 55 60

Gln Leu Tyr Cys Arg Thr Gly Phe His Leu Glu Ile Phe Pro Asn Gly
65 70 75 80

Thr Ile Gln Gly Thr Arg Lys Asp His Ser Arg Phe Gly Ile Leu Glu
85 90 95

Phe Ile Ser Ile Ala Val Gly Leu Val Ser Ile Arg Gly Val Asp Ser
100 105 110

Gly Leu Tyr Leu Gly Met Asn Glu Lys Gly Glu Leu Tyr Gly Ser Glu
115 120 125

Lys Leu Thr Gln Glu Cys Val Phe Arg Glu Gln Phe Glu Glu Asn Trp
130 135 140

Tyr Asn Thr Tyr Ser Ser Asn Leu Tyr Lys His Val Asp Thr Gly Arg
145 150 155 160

Arg Tyr Tyr Val Ala Leu Asn Lys Asp Gly Thr Pro Arg Glu Gly Thr
165 170 175

Arg Thr Lys Arg His Gln Lys Phe Thr His Phe Leu Pro Arg Pro Val
180 185 190

Asp Pro Asp Lys Val Pro Glu Leu Tyr Lys Asp Ile Leu Ser Gln Ser
195 200 205

<210> 19
<211> 194
<212> PRT
<213> Homo sapiens

<400> 19

204020"212500F

Met His Lys Trp Ile Leu Thr Trp Ile Leu Pro Thr Leu Leu Tyr Arg
1 5 10 15
Ser Cys Phe His Ile Ile Cys Leu Val Gly Thr Ile Ser Leu Ala Cys
20 25 30
Asn Asp Met Thr Pro Glu Gln Met Ala Thr Asn Val Asn Cys Ser Ser
35 40 45
Pro Glu Arg His Thr Arg Ser Tyr Asp Tyr Met Glu Gly Gly Asp Ile
50 55 60
Arg Val Arg Arg Leu Phe Cys Arg Thr Gln Trp Tyr Leu Arg Ile Asp
65 70 75 80
Lys Arg Gly Lys Val Lys Gly Thr Gln Glu Met Lys Asn Asn Tyr Asn
85 90 95
Ile Met Glu Ile Arg Thr Val Ala Val Gly Ile Val Ala Ile Lys Gly
100 105 110
Val Glu Ser Glu Phe Tyr Leu Ala Met Asn Lys Glu Gly Lys Leu Tyr
115 120 125
Ala Lys Lys Glu Cys Asn Glu Asp Cys Asn Phe Lys Glu Leu Ile Leu
130 135 140
Glu Asn His Tyr Asn Thr Tyr Ala Ser Ala Lys Trp Thr His Asn Gly
145 150 155 160
Gly Glu Met Phe Val Ala Leu Asn Gln Lys Gly Ile Pro Val Arg Gly
165 170 175
Lys Lys Thr Lys Lys Glu Gln Lys Thr Ala His Phe Leu Pro Met Ala
180 185 190
Ile Thr

<210> 20
<211> 208
<212> PRT
<213> Homo sapiens

<400> 20
Met Trp Lys Trp Ile Leu Thr His Cys Ala Ser Ala Phe Pro His Leu
1 5 10 15
Pro Gly Cys Cys Cys Cys Cys Phe Leu Leu Leu Phe Leu Val Ser Ser
20 25 30
Val Pro Val Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu
35 40 45
Ala Thr Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly
50 55 60
Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg
65 70 75 80
Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly

10033346.010402

```

      85                                     90                                     95
Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu
      100                                      105                                      110

Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser
      115                                      120                                      125

Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys
      130                                      135                                      140

Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly
      145                                      150                                      155                                      160

Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met
      165                                      170                                      175

Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr
      180                                      185                                      190

Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
      195                                      200                                      205


<210> 21
<211> 239
<212> PRT
<213> Homo sapiens


<400> 21
Met Gly Leu Ile Trp Leu Leu Leu Leu Ser Leu Leu Glu Pro Gly Trp
   1          5          10          15

Pro Ala Ala Gly Pro Gly Ala Arg Leu Arg Arg Asp Ala Gly Gly Arg
    20          25          30

Gly Gly Val Tyr Glu His Leu Gly Gly Ala Pro Arg Arg Arg Lys Leu
    35          40          45

Tyr Cys Ala Thr Lys Tyr His Leu Gln Leu His Pro Ser Gly Arg Val
   50          55          60

Asn Gly Ser Leu Glu Asn Ser Ala Tyr Ser Ile Leu Glu Ile Thr Ala
   65          70          75          80

Val Glu Val Gly Ile Val Ala Ile Arg Gly Leu Phe Ser Gly Arg Tyr
    85          90          95

Leu Ala Met Asn Lys Arg Gly Arg Leu Tyr Ala Ser Glu His Tyr Ser
    100          105          110

Ala Glu Cys Glu Phe Val Glu Arg Ile His Glu Leu Gly Tyr Asn Thr
   115          120          125

Tyr Ala Ser Arg Leu Tyr Arg Thr Val Ser Ser Thr Pro Gly Ala Arg
   130          135          140

Arg Gln Pro Ser Ala Glu Arg Leu Trp Tyr Val Ser Val Asn Gly Lys
   145          150          155          160
```


210	215	220
Val His Phe Met Lys Arg Leu Pro Arg Gly His His Thr Thr Glu Gln		
225	230	235 240
Ser Leu Arg Phe Glu Phe Leu Asn Tyr Pro Pro Phe Thr Arg Ser Leu		
	245	250 255
Arg Gly Ser Gln Arg Thr Trp Ala Pro Glu Pro Arg		
	260	265

<210> 23
 <211> 4177
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (593)..(1216)

<400> 23
 ggaattccgg gaagagaggg aagaaaacaa cggcgactgg gcagctgcct ccacttctga 60
 caactccaaa gggatatact tgtagaagtg gctcgcaggg tggggctccg cagagagaga 120
 ccagaaggtg ccaaccgcag aggggtgcag atatctcccc ctattcccca cccacctcc 180
 cttgggtttt gttcacctg ctgtcatctg tttttcagac ctttttgga tctaactgg 240
 tgaagaaagg agtaaagaag agaacaaagt aactcctggg ggagcgaaga gcgctggtga 300
 ccaacaccac caacgccacc accagctcct gctgctgcgg ccacccacgt ccaccattta 360
 ccgggaggct ccagaggcgt aggcagcggg tccgagaaag gagcgagggg agtcagccgg 420
 cttttccgag gagttatgga tggttggtgca ttcacttctg gccagatccg cgcccagagg 480
 gagctaacca gcagccacca cctcgagctc tctccttgcc ttgcatcggg tttaccctt 540
 ccagtatgtt ctttctgatg agacaatttc cagtgccgag agtttcagta ca atg tgg 598
 Met Trp
 1

aaa tgg ata ctg aca cat tgt gcc tca gcc ttt ccc cac ctg ccc ggc	646
Lys Trp Ile Leu Thr His Cys Ala Ser Ala Phe Pro His Leu Pro Gly	
5 10 15	

tgc tgc tgc tgc tgc ttt ttg ttg ctg ttc ttg gtg tct tcc gtc cct	694
Cys Cys Cys Cys Cys Phe Leu Leu Leu Phe Leu Val Ser Ser Val Pro	
20 25 30	

gtc acc tgc caa gcc ctt ggt cag gac atg gtg tca cca gag gcc acc	742
Val Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr	
35 40 45 50	

aac tct tct tcc tcc tcc ttc tcc tct cct tcc agc gcg gga agg cat	790
Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His	
55 60 65	

gtg cgg agc tac aat cac ctt caa gga gat gtc cgc tgg aga aag cta	838
Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu	

2040070 "020500"

70	75	80	
ttc tct ttc acc aag tac ttt ctc aag att gag aag aac ggg aag gtc			886
Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val			
85	90	95	
agc ggg acc aag aag gag aac tgc ccg tac agc atc ctg gag ata aca			934
Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr			
100	105	110	
tca gta gaa atc gga gtt gtt gcc gtc aaa gcc att aac agc aac tat			982
Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr			
115	120	125	130
tac tta gcc atg aac aag aag ggg aaa ctc tat ggc tca aaa gaa ttt			1030
Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe			
	135	140	145
aac aat gac tgt aag ctg aag gag agg ata gag gaa aat gga tac aat			1078
Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn			
	150	155	160
acc tat gca tca ttt aac tgg cag cat aat ggg agg caa atg tat gtg			1126
Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val			
	165	170	175
gca ttg aat gga aaa gga gct cca agg aga gga cag aaa aca cga agg			1174
Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg			
	180	185	190
aaa aac acc tct gct cac ttt ctt cca atg gtg gta cac tca			1216
Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser			
	195	200	205
tagaggaagg caacgtttgt ggatgcagta aaaccaatgg ctcttttgcc aagaatagtg			1276
gatattcttc atgaagacag tagattgaaa ggcaaagaca cgttgcagat gtctgcttgc			1336
ttaaaagaaa gccagccttt gaaggttttt gtattcactg ctgacatatg atgttctttt			1396
aattagttct gtgtcatgtc ttataatcaa gatataggca gatcgaatgg gatagaagtt			1456
attcccaagt gaaaaacatt gtggctgggt tttttgttgt tgttgtcaag tttttgtttt			1516
taaacctctg agatagaact taaaggacat agaacaatct gttgaaagaa cgatcttcgg			1576
gaaagttatt tatggaatac gaactcatat caaagacttc attgctcatt caagccta			1636
gaatcaatga acagtaatac gtgcaagcat ttactggaaa gcacttgggt catatcatat			1696
gcacaaccaa aggagttctg gatgtggtct catggaataa ttgaatagaa tttaaaaata			1756
taaacatggt agtgtgaaac tgttctaaca atacaaatag tatgggtatgc ttgtgcattc			1816
tgccttcac cctttctatt tctttctaag ttattttatt aataggatgt taaatatctt			1876
ttggggtttt aaagagtatc tcagcagotg tcttctgatt tatcttttct ttttattcag			1936
cacaccacat gcatgttcac gacaaagtgt ttttaaaact tggcgaacac ttcaaaaata			1996
ggagttggga ttagggaagc agtatgagtg ccggtgtgct atcagttgac ttaatttgca			2056

cttctgcagt aataaccatc aacaataaat atggcaatgc tgtgccatgg cttgagtgag 2116
agatgtctgc tatcatttga aaacatatat tactctcgag gcttcctgtc tcaagaaata 2176
gaccagaagg ccaaattctt ctctttcaat acatcagttt gcctccaaga atatactaaa 2236
aaaaggaaaa ttaattgcta aatacattta aatagcctag cctcattatt tactcatgat 2296
ttcttgccaa atgtcatggc ggtaaagagg ctgtccacat ctctaaaaac cctctgtaaa 2356
ttccacataa tgcattcttc ccaaaggaac tataaagaat ttggtatgaa gcgcaactct 2416
cccaggggct taaactgagc aaatcaaata tatactggta tatgtgtaac catatacaaa 2476
aacctgttct agctgtatga tctagtcttt acaaaaccaa ataaaacttg ttttctgtaa 2536
atttaaagag ctttacaagg ttccataatg taaccatatac aaaattcatt ttgttagagc 2596
acgtatagaa aagagtacat aagagtttac caatcatcat cacattgtat tccactaaat 2656
aaatacataa gccttatttg cagtgtctgt agtgatttta aaaatgtaga aaaatactat 2716
ttgttctaaa tacttttaag caataactat aatagtatat tgatgctgca gttttatctt 2776
catatttctt gttttgaaaa agcattttat tgtttgaca cagtattttg gtacaaaaaa 2836
aaagactcac taaatgtgtc ttactaaagt ttaacctttg gaaatgctgg cgttctgtga 2896
ttctccaaca aacttatttg tgtcaatact taaccagcac ttccagttaa tctgttattt 2956
ttaaaaattg ctttattaag aaattttttg tataatccca taaaaggcca tatttttccc 3016
attcttcaaa aaaactgtat ttcagaagaa acacatttga ggcaactgtc tttggcttat 3076
agttttaaatt gcatttcac atactttgct tccaacttgc tttttggcaa atgagattat 3136
aaaaatggtt aatttttgtg gttggaatct ggatgttaaa atttaattgg taactcagtc 3196
tgtgagctat aatgtaatgc attcctatcc aaactaggtt tctttttttc ctttatgttg 3256
aaataataat ggcacctgac acatagacat agaccacca caacctaaat taaatgtttg 3316
gtaagacaaa tacacattgg atgaccacag taacagcaaa cagggcacia actggattct 3376
tatttcacat agacatttag attactaaag agggctatgt gtaaacagtc atcattatag 3436
tactcaagac actaaaacag cttctagcca aatatattaa agcttgcaga ggccaaaaat 3496
agaaaacatc tcccctgtct ctcccacatt tccctcacag aaagacaaaa aacctgcctg 3556
gtgcagtagc tcacacctgt aatcccagca gtttgggaga ctgtgggaag atggcttgag 3616
tccaggagtt ctagacaggc ctgagaaacc tagtgagaca tccttctctt aaacaaaaca 3676
aaacaaaaca aatgtagcca tgcgtggtgg catatacctg tggccccaac tactcaggag 3736
gctgaaacgg aaggatctct tgggccccag gagtttgagg ctgcagtgag ctataatctt 3796
gccattgcac tccagcctgg gtgaaaaaga gccagaaaga aaggaaagag agaaaagaga 3856
aaagaaagag agaaaagaca gaaagacagg aaggaaggaa ggaaggaagg aaggaaggaa 3916

ggaagcaagg aaagaaggaa ggaaggaaaag aagggaggga aggaaggaga gagaaagaaa 3976
gattgtttgg taaggagtaa tgacattctc ttgcatttaa aagtggcata tttgcttgaa 4036
atggaaatag aattctgggc ccttttgcaa ctactgaaga aaaaaaaaag cagtttcagc 4096
cctgaatgtt gtagatttga aaaaaaaaaa aaaaaaactc gaggggggggc ccgtacccaa 4156
ttcgccctat agtgagtcgt a 4177

<210> 24
<211> 208
<212> PRT
<213> Homo sapiens

<400> 24
Met Trp Lys Trp Ile Leu Thr His Cys Ala Ser Ala Phe Pro His Leu
1 5 10 15
Pro Gly Cys Cys Cys Cys Cys Phe Leu Leu Leu Phe Leu Val Ser Ser
20 25 30
Val Pro Val Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu
35 40 45
Ala Thr Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly
50 55 60
Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg
65 70 75 80
Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly
85 90 95
Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu
100 105 110
Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser
115 120 125
Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys
130 135 140
Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly
145 150 155 160
Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met
165 170 175
Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr
180 185 190
Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
195 200 205

<210> 25
<211> 31
<212> PRT
<213> Homo sapiens

1003542.030402

<400> 25

Gly Gln Asp Met Val Ser Pro Glu Ala Thr Asn Ser Ser Ser Ser Ser
1 5 10 15

Phe Ser Ser Pro Ser Ser Ala Gly Arg His Val Arg Ser Tyr Asn
20 25 30

<210> 26

<211> 19

<212> PRT

<213> Homo sapiens

<400> 26

Lys Ile Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys
1 5 10 15

Pro Tyr Ser

<210> 27

<211> 30

<212> PRT

<213> Homo sapiens

<400> 27

Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys
1 5 10 15

Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr
20 25 30

<210> 28

<211> 19

<212> PRT

<213> Homo sapiens

<400> 28

Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn
1 5 10 15

Thr Ser Ala

<210> 29

<211> 555

<212> DNA

<213> Artificial Sequence

<220>

<221> CDS

<222> (1)..(552)

<220>

<223> Description of Artificial Sequence: pQE60-Cys37
construct

<400> 29

atg aga gga tcg cat cac cat cac cat cac gga tcc tgc cag gct ctg 48

```
<210> 30
<211> 184
<212> PRT
<213> Artificial Sequence
<223> Description of Artificial Sequence: pQE60-Cys37
      construct
```

```

<400> 30
Met Arg Gly Ser His His His His His His Gly Ser Cys Gln Ala Leu
  1                    5                      10                15

Gly Gln Asp Met Val Ser Pro Glu Ala Thr Asn Ser Ser Ser Ser Ser
          20                25                30

```

Phe Ser Ser Pro Ser Ser Ala Gly Arg His Val Arg Ser Tyr Asn His
35 40 45

Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr
50 55 60

Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu
65 70 75 80

Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val
85 90 95

Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys
100 105 110

Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu
115 120 125

Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn
130 135 140

Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly
145 150 155 160

Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His
165 170 175

Phe Leu Pro Met Val Val His Ser
180

<210> 31
<211> 84
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 31
atgtggaaat ggatactgac ccactgcgct tctgctttcc cgcacctgcc gggttgctgc 60
tgctgctgct tctgctgct gtcc 84

<210> 32
<211> 82
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 32
ccggagaaac catgtcctga cccagagcct ggcaggtaac cggaacagaa gaaaccagga 60
acagcagcag gaagcagcag ca 82

<210> 33
<211> 80

1005551.010400

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 33
gggtcaggac atggtttctc cggaagctac caactcttct tcttcttctt tctcttctcc 60
gtcttctgct ggtcgtcacg 80

<210> 34
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 34
ggtgaaagag aacagtttac gccaacgaac gtcaccctgc aggtggttgt aagaacgaac 60
gtgacgacca gcagaagacg g 81

<210> 35
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 35
cgttggcgta aactgttctc tttcaccaaa tacttctga aaatcgaaaa aaacggtaaa 60
gtttctggga ccaaa 75

<210> 36
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 36
tttgggtccca gaaactttac cgtttttttc gattttcag 39

<210> 37
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

1005460400

<400> 37
aaaggatcca tgtggaaatg gatactgacc cactgc 36

<210> 38
<211> 627
<212> DNA
<213> Escherichia coli

<220>
<221> CDS
<222> (1)..(627)

<400> 38
atg tgg aaa tgg ata ctg acc cac tgc gct tct gct ttc ccg cac ctg 48
Met Trp Lys Trp Ile Leu Thr His Cys Ala Ser Ala Phe Pro His Leu
1 5 10 15

ccg ggt tgc tgc tgc tgc tgc ttc ctg ctg ctg ttc ctg gtt tct tct 96
Pro Gly Cys Cys Cys Cys Cys Phe Leu Leu Leu Phe Leu Val Ser Ser
20 25 30

gtt ccg gtt acc tgc cag gct ctg ggt cag gac atg gtt tct ccg gaa 144
Val Pro Val Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu
35 40 45

gct acc aac tct tcc tct tcc tct ttc tct tcc ccg act tcc gct ggt 192
Ala Thr Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Thr Ser Ala Gly
50 55 60

cgt cac gtt cgt tct tac aac cac ctg cag ggt gac gtt cgt tgg cgt 240
Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg
65 70 75 80

aaa ctg ttc tct ttc acc aaa tac ttc ctg aaa atc gaa aaa aac ggt 288
Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly
85 90 95

aaa gtt tct ggg acc aag aag gag aac tgc ccg tac agc atc ctg gag 336
Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu
100 105 110

ata aca tca gta gaa atc gga gtt gtt gcc gtc aaa gcc att aac agc 384
Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser
115 120 125

aac tat tac tta gcc atg aac aag aag ggg aaa ctc tat ggc tca aaa 432
Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys
130 135 140

gaa ttt aac aat gac tgt aag ctg aag gag agg ata gag gaa aat gga 480
Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly
145 150 155 160

tac aat acc tat gca tca ttt aac tgg cag cat aat ggg agg caa atg 528
Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met
165 170 175

tat gtg gca ttg aat gga aaa gga gct cca agg aga gga cag aaa aca 576
Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr
180 185 190

624

627

<210> 39

<211> 208

<212> PRT

<213> Escherichia coli

<400> 39

Met Trp Lys Trp Ile Leu Thr His Cys Ala Ser Ala Phe Pro His Leu
1 5 10 15

Pro Gly Cys Cys Cys Cys Phe Leu Leu Phe Leu Val Ser Ser

Val Pro Val Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu

Ala Thr Asn Ser Ser Ser Ser Phe Ser Ser Pro Thr Ser Ala Gly

Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg
65 70 75 80

Lys⁶⁵ Leu⁷⁰ Phe⁷⁵ Ser⁸⁰ Phe⁸⁵ Thr⁹⁰ Lys⁹⁵ Tyr¹⁰⁰ Phe¹⁰⁵ Leu¹¹⁰ Lys¹¹⁵ Ile¹²⁰ Glu¹²⁵ Lys¹³⁰ Asn¹³⁵ Gly¹⁴⁰

Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu

Ile Thr Ser Val Glu Ile Gly Val Ala Val Lys Ala Ile Asn Ser

Asn Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys

Glu	Phe	Asn	Asn	Asp	Cys	Lys	Leu	Lys	Glu	Arg	Ile	Glu	Glu	Asn	Gly
145					150					155					160

Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met
145 150 155 165 170 175

Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr

Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser

<210> 40

<211> 38

<212> DNA

<213> Artificial Sequence

 $\langle 220 \rangle$

<223> Description of Artificial Sequence: primer

<400> 40

tttcatgact tgtcaagctc tgggtcaaga tatggttc

38

<210> 41

<211> 28

<212> DNA

<213> Artificial Sequence

 $\langle 220 \rangle$

<223> Description of Artificial Sequence: primer

<400> 41
gccaagctt ccacaaacgt tgccttcc

28

<210> 42
<211> 525
<212> DNA
<213> Escherichia coli

<220>
<221> CDS
<222> (1)..(522)

<400> 42
atg acc tgc cag gct ctg ggt cag gac atg gtt tct ccg gaa gct acc 48
Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
1 5 10 15

aac tct tcc tct tcc tct ttc tct tcc ccg tct tcc gct ggt cgt cac 96
Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
20 25 30

gtt cgt tct tac aac cac ctg cag ggt gac gtt cgt tgg cgt aaa ctg 144
Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu
35 40 45

ttc tct ttc acc aaa tac ttc ctg aaa atc gaa aaa aac ggt aaa gtt 192
Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val
50 55 60

tct ggg acc aag aag gag aac tgc ccg tac agc atc ctg gag ata aca 240
Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr
65 70 75 80

tca gta gaa atc gga gtt gtt gcc gtc aaa gcc att aac agc aac tat 288
Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr
85 90 95

tac tta gcc atg aac aag aag ggg aaa ctc tat ggc tca aaa gaa ttt 336
Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe
100 105 110

aac aat gac tgt aag ctg aag gag agg ata gag gaa aat gga tac aat 384
Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn
115 120 125

acc tat gca tca ttt aac tgg cag cat aat ggg agg caa atg tat gtg 432
Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val
130 135 140

gca ttg aat gga aaa gga gct cca agg aga gga cag aaa aca cga agg 480
Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg
145 150 155 160

aaa aac acc tct gct cac ttt ctt cca atg gtg gta cac tca tag 525
Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
165 170

<210> 43
<211> 174
<212> PRT

20250307 14:00:00

<400> 45
tcattgacttg ccaggcactg ggtcaagaca tggtttcccc ggaagcta 48

<220>
<223> Description of Artificial Sequence: synthetic primer

```
<210> 47
<211> 48
<212> DNA
<213> Artificial Sequence
```

```
<220>
<223> Description of Artificial Sequence: synthetic
      primer
```

<400> 47
gttcgttggc gcaaactgtt cagctttacc aagtacttcc tgaaaatc 48

```
<210> 48
<211> 28
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: synthetic primer

<400> 48
tcgaaaaaaaaa cggtaaagtt tctgggac 28

```
<210> 49
<211> 48
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: synthetic primer

<400> 49
gatgggctgc tgaagctaga gctggagctg ttggtagctt ccggggaa 48

```
<210> 50
<211> 45
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: synthetic primer

<400> 50
aacagtgttgc gccaacgaac atcacccctgt aagtgggtgt aagag 45

<210> 51
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 51
ttcttggtcc cagaaacttt accgtttttt tcgattttca ggaagta 47

<210> 52
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 52
ttcttggtcc cagaaacttt accg 24

<210> 53
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: synthetic
primer

<400> 53
agatcaggct tctattatta tgagtgtacc accattggaa gaaag 45

<210> 54
<211> 525
<212> DNA
<213> Escherichia coli

<220>
<221> CDS
<222> (1)..(522)

<400> 54
atg act tgc cag gca ctg ggt caa gac atg gtt tcc ccg gaa gct acc 48
Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
1 5 10 15

aac agc tcc agc tct agc ttc agc agc cca tct agc gca ggt cgt cac 96
Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
20 25 30

ggt cgc tct tac aac cac tta cag ggt gat gtt cgt tgg cgc aaa ctg 144

204070"2123001

Val	Arg	Ser	Tyr	Asn	His	Leu	Gln	Gly	Asp	Val	Arg	Trp	Arg	Lys	Leu	
		35					40					45				
ttc	agc	ttt	acc	aag	tac	ttc	ctg	aaa	atc	gaa	aaa	aac	ggt	aaa	gtt	192
Phe	Ser	Phe	Thr	Lys	Tyr	Phe	Leu	Lys	Ile	Glu	Lys	Asn	Gly	Lys	Val	
	50					55					60					
tct	ggg	acc	aag	aag	gag	aac	tgc	ccg	tac	agc	atc	ctg	gag	ata	aca	240
Ser	Gly	Thr	Lys	Lys	Glu	Asn	Cys	Pro	Tyr	Ser	Ile	Leu	Glu	Ile	Thr	
	65				70					75					80	
tca	gta	gaa	atc	gga	gtt	gtt	gcc	gtc	aaa	gcc	att	aac	agc	aac	tat	288
Ser	Val	Glu	Ile	Gly	Val	Val	Ala	Val	Lys	Ala	Ile	Asn	Ser	Asn	Tyr	
				85					90					95		
tac	tta	gcc	atg	aac	aag	aag	ggg	aaa	ctc	tat	ggc	tca	aaa	gaa	ttt	336
Tyr	Leu	Ala	Met	Asn	Lys	Lys	Gly	Lys	Leu	Tyr	Gly	Ser	Lys	Glu	Phe	
			100					105					110			
aac	aat	gac	tgt	aag	ctg	aag	gag	agg	ata	gag	gaa	aat	gga	tac	aat	384
Asn	Asn	Asp	Cys	Lys	Leu	Lys	Glu	Arg	Ile	Glu	Glu	Asn	Gly	Tyr	Asn	
		115					120					125				
acc	tat	gca	tca	ttt	aac	tgg	cag	cat	aat	ggg	agg	caa	atg	tat	gtg	432
Thr	Tyr	Ala	Ser	Phe	Asn	Trp	Gln	His	Asn	Gly	Arg	Gln	Met	Tyr	Val	
	130					135					140					
gca	ttg	aat	gga	aaa	gga	gct	cca	agg	aga	gga	cag	aaa	aca	cga	agg	480
Ala	Leu	Asn	Gly	Lys	Gly	Ala	Pro	Arg	Arg	Gly	Gln	Lys	Thr	Arg	Arg	
	145				150					155					160	
aaa	aac	acc	tct	gct	cac	ttt	ctt	cca	atg	gtg	gta	cac	tca	tag		525
Lys	Asn	Thr	Ser	Ala	His	Phe	Leu	Pro	Met	Val	Val	His	Ser			
				165					170							
<210> 55																
<211> 174																
<212> PRT																
<213> Escherichia coli																
<400> 55																
Met	Thr	Cys	Gln	Ala	Leu	Gly	Gln	Asp	Met	Val	Ser	Pro	Glu	Ala	Thr	
	1			5					10					15		
Asn	Ser	Ser	Ser	Ser	Ser	Phe	Ser	Ser	Pro	Ser	Ser	Ala	Gly	Arg	His	
			20					25					30			
Val	Arg	Ser	Tyr	Asn	His	Leu	Gln	Gly	Asp	Val	Arg	Trp	Arg	Lys	Leu	
		35					40					45				
Phe	Ser	Phe	Thr	Lys	Tyr	Phe	Leu	Lys	Ile	Glu	Lys	Asn	Gly	Lys	Val	
	50					55					60					
Ser	Gly	Thr	Lys	Lys	Glu	Asn	Cys	Pro	Tyr	Ser	Ile	Leu	Glu	Ile	Thr	
	65				70					75					80	
Ser	Val	Glu	Ile	Gly	Val	Val	Ala	Val	Lys	Ala	Ile	Asn	Ser	Asn	Tyr	
				85					90					95		
Tyr	Leu	Ala	Met	Asn	Lys	Lys	Gly	Lys	Leu	Tyr	Gly	Ser	Lys	Glu	Phe	
			100					105					110			

10035516 010406

Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn
115 120 125
Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val
130 135 140
Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg
145 150 155 160
Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
165 170

<210> 56
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 56
ggaccctcat gacctgccag gctctgggtc aggac 35

<210> 57
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 57
ggacagccat ggctggctcg cacgttcg 28

<210> 58
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 58
ggacagccat gggtcggttg cgtaaactg 29

<210> 59
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 59
ggacagccat ggaaaaaac ggtaaagttt c 31

204010"272300T

<210> 60
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 60
ggacccccat ggagaactgc ccgtagagc 29

<210> 61
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 61
ggacccccat ggtcaaagcc attaacagca ac 32

<210> 62
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 62
ggacccccat ggggaaactc tatggctcaa aag 33

<210> 63
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 63
ctgcccaagc ttattatgag tgtaccacca ttggaag 37

<210> 64
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 64
ctgcccaagc ttattacttc agcttacagt cattgt 36

<210> 65
<211> 525

2025-01-01 10:00:00

<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(522)

```

<400> 65
atg acc tgc cag gct ctg ggt cag gac atg gtt tct ccg gaa gct acc 48
Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
   1             5             10             15

aac tct tcc tct tcc tct ttc tct tcc ccg tct tcc gct ggt cgt cac 96
Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
           20             25             30

gtt cgt tct tac aac cac ctg cag ggt gac gtt cgt tgg cgt aaa ctg 144
Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu
           35             40             45

ttc tct ttc acc aaa tac ttc ctg aaa atc gaa aaa aac ggt aaa gtt 192
Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val
           50             55             60

tct ggg acc aag aag gag aac tgc ccg tac agc atc ctg gag ata aca 240
Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr
   65             70             75             80

tca gta gaa atc gga gtt gtt gcc gtc aaa gcc att aac agc aac tat 288
Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr
           85             90             95

tac tta gcc atg aac aag aag ggg aaa ctc tat ggc tca aaa gaa ttt 336
Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe
           100            105            110

aac aat gac tgt aag ctg aag gag agg ata gag gaa aat gga tac aat 384
Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn
           115            120            125

acc tat gca tca ttt aac tgg cag cat aat ggg agg caa atg tat gtg 432
Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val
           130            135            140

gca ttg aat gga aaa gga gct cca agg aga gga cag aaa aca cga agg 480
Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg
           145            150            155            160

aaa aac acc tct gct cac ttt ctt cca atg gtg gta cac tca tag 525
Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
           165            170

```

<210> 66
<211> 174
<212> PRT
<213> Homo sapiens

```

<400> 66
Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr
   1             5             10             15

```

10039946.010402

Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His
20 25 30
Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu
35 40 45
Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val
50 55 60
Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr
65 70 75 80
Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr
85 90 95
Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe
100 105 110
Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn
115 120 125
Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val
130 135 140
Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg
145 150 155 160
Lys Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
165 170

<210> 67
<211> 444
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(444)

<400> 67
atg gct ggt cgt cac gtt cgt tct tac aac cac ctg cag ggt gac gtt 48
Met Ala Gly Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val
1 5 10 15
cgt tgg cgt aaa ctg ttc tct ttc acc aaa tac ttc ctg aaa atc gaa 96
Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu
20 25 30
aaa aac ggt aaa gtt tct ggg acc aag aag gag aac tgc ccg tac agc 144
Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser
35 40 45
atc ctg gag ata aca tca gta gaa atc gga gtt gtt gcc gtc aaa gcc 192
Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala
50 55 60
att aac agc aac tat tac tta gcc atg aac aag aag ggg aaa ctc tat 240
Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr
65 70 75 80

```
<210> 68
<211> 147
<212> PRT
<213> Homo sapiens
```

```

<400> 68
Met Ala Gly Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val
  1                    5          10          15
Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu
          20          25          30
Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser
      35          40          45
Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala
      50          55          60
Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr
  65          70          75          80
Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu
          85          90          95
Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His Asn Gly
          100          105          110
Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly
          115          120          125
Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro Met Val
      130          135          140
Val His Ser
145

```

```
<210> 69
<211> 402
<212> DNA
<213> Homo sapiens
```

```
<220>  
<221> CDS  
<222> (1)..(402)
```

<400> 69
atg gtt cgt tgg cgt aaa ctg ttc tct ttc acc aaa tac ttc ctg aaa 48
Met Val Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys

1	5	10	15	
atc gaa aaa aac ggt aaa gtt tct ggg acc aag aag gag aac tgc ccg				96
Ile Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro	20	25	30	
tac agc atc ctg gag ata aca tca gta gaa atc gga gtt gtt gcc gtc				144
Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val	35	40	45	
aaa gcc att aac agc aac tat tac tta gcc atg aac aag aag ggg aaa				192
Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys	50	55	60	
ctc tat ggc tca aaa gaa ttt aac aat gac tgt aag ctg aag gag agg				240
Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg	65	70	75	80
ata gag gaa aat gga tac aat acc tat gca tca ttt aac tgg cag cat				288
Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His	85	90	95	
aat ggg agg caa atg tat gtg gca ttg aat gga aaa gga gct cca agg				336
Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg	100	105	110	
aga gga cag aaa aca cga agg aaa aac acc tct gct cac ttt ctt cca				384
Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro	115	120	125	
atg gtg gta cac tca tag				402
Met Val Val His Ser	130			
<210> 70				
<211> 133				
<212> PRT				
<213> Homo sapiens				
<400> 70				
Met Val Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys	1	5	10	15
Ile Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro	20	25	30	
Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val	35	40	45	
Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys	50	55	60	
Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg	65	70	75	80
Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His	85	90	95	
Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg	100	105	110	
Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro	115	120	125	
Met Val Val His Ser	130			

10035213.010402

<210> 71
 <211> 354
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(354)

<400> 71
 atg gaa aaa aac ggt aaa gtt tct ggg acc aag aag gag aac tgc ccg 48
 Met Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro
 1 5 10 15
 tac agc atc ctg gag ata aca tca gta gaa atc gga gtt gtt gcc gtc 96
 Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val
 20 25 30
 aaa gcc att aac agc aac tat tac tta gcc atg aac aag aag ggg aaa 144
 Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys
 35 40 45
 ctc tat ggc tca aaa gaa ttt aac aat gac tgt aag ctg aag gag agg 192
 Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg
 50 55 60
 ata gag gaa aat gga tac aat acc tat gca tca ttt aac tgg cag cat 240
 Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His
 65 70 75 80
 aat ggg agg caa atg tat gtg gca ttg aat gga aaa gga gct cca agg 288
 Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg
 85 90 95
 aga gga cag aaa aca cga agg aaa aac acc tct gct cac ttt ctt cca 336
 Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro
 100 105 110
 atg gtg gta cac tca tag 354
 Met Val Val His Ser
 115

<210> 72
 <211> 117
 <212> PRT
 <213> Homo sapiens

<400> 72
 Met Glu Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro
 1 5 10 15
 Tyr Ser Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val
 20 25 30
 Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys
 35 40 45
 Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys Glu Arg
 50 55 60
 Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp Gln His
 65 70 75 80
 Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala Pro Arg
 85 90 95
 Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe Leu Pro

1003542 "010402"

110

```
<220>
<221> CDS
<222> (1)..(321)
```

<400>	73																
atg	gag	aac	tgc	ccg	tac	agc	atc	ctg	gag	ata	aca	tca	gta	gaa	atc	48	
Met	Glu	Asn	Cys	Pro	Tyr	Ser	Ile	Leu	Glu	Ile	Thr	Ser	Val	Glu	Ile		
1				5					10					15			
gga	gtt	gtt	gcc	gtc	aaa	gcc	att	aac	agc	aac	tat	tac	tta	gcc	atg	96	
Gly	Val	Val	Ala	Val	Lys	Ala	Ile	Asn	Ser	Asn	Tyr	Tyr	Leu	Ala	Met		
			20					25					30				
aac	aag	aag	ggg	aaa	ctc	tat	ggc	tca	aaa	gaa	ttt	aac	aat	gac	tgt	144	
Asn	Lys	Lys	Gly	Lys	Leu	Tyr	Gly	Ser	Lys	Glu	Phe	Asn	Asn	Asp	Cys		
		35					40					45					
aag	ctg	aag	gag	agg	ata	gag	gaa	aat	gga	tac	aat	acc	tat	gca	tca	192	
Lys	Leu	Lys	Glu	Arg	Ile	Glu	Glu	Asn	Gly	Tyr	Asn	Thr	Tyr	Ala	Ser		
	50					55					60						
ttt	aac	tgg	cag	cat	aat	ggg	agg	caa	atg	tat	gtg	gca	ttg	aat	gga	240	
Phe	Asn	Trp	Gln	His	Asn	Gly	Arg	Gln	Met	Tyr	Val	Ala	Leu	Asn	Gly		
65					70					75					80		
aaa	gga	gct	cca	agg	aga	gga	cag	aaa	aca	cga	agg	aaa	aac	acc	tct	288	
Lys	Gly	Ala	Pro	Arg	Arg	Gly	Gln	Lys	Thr	Arg	Arg	Lys	Asn	Thr	Ser		
				85					90					95			
gct	cac	ttt	ctt	cca	atg	gtg	gta	cac	tca	tag						321	
Ala	His	Phe	Leu	Pro	Met	Val	Val	His	Ser								
			100					105									

```
<210> 74
<211> 106
<212> PRT
<213> Homo sapiens
```

<400>	74																
Met	Glu	Asn	Cys	Pro	Tyr	Ser	Ile	Leu	Glu	Ile	Thr	Ser	Val	Glu	Ile		
1				5					10					15			
Gly	Val	Val	Ala	Val	Lys	Ala	Ile	Asn	Ser	Asn	Tyr	Tyr	Leu	Ala	Met		
			20					25					30				
Asn	Lys	Lys	Gly	Lys	Leu	Tyr	Gly	Ser	Lys	Glu	Phe	Asn	Asn	Asp	Cys		
.		35					40					45					
Lys	Leu	Lys	Glu	Arg	Ile	Glu	Glu	Asn	Gly	Tyr	Asn	Thr	Tyr	Ala	Ser		
	50				55						60						
Phe	Asn	Trp	Gln	His	Asn	Gly	Arg	Gln	Met	Tyr	Val	Ala	Leu	Asn	Gly		
65				70						75					80		
Lys	Gly	Ala	Pro	Arg	Arg	Gly	Gln	Lys	Thr	Arg	Arg	Lys	Asn	Thr	Ser		

Ala His Phe Leu Pro Met Val Val His Ser
 100 85 90 95
 105

<210> 75
 <211> 264
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(261)

<400> 75
 atg gtc aaa gcc att aac agc aac tat tac tta gcc atg aac aag aag 48
 Met Val Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys
 1 5 10 15
 ggg aaa ctc tat ggc tca aaa gaa ttt aac aat gac tgt aag ctg aag 96
 Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys
 20 25 30
 gag agg ata gag gaa aat gga tac aat acc tat gca tca ttt aac tgg 144
 Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp
 35 40 45
 cag cat aat ggg agg caa atg tat gtg gca ttg aat gga aaa gga gct 192
 Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala
 50 55 60
 cca agg aga gga cag aaa aca cga agg aaa aac acc tct gct cac ttt 240
 Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe
 65 70 75 80
 ctt cca atg gtg gta cac tca tag 264
 Leu Pro Met Val Val His Ser
 85

<210> 76
 <211> 87
 <212> PRT
 <213> Homo sapiens

<400> 76
 Met Val Lys Ala Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys
 1 5 10 15
 Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys
 20 25 30
 Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn Trp
 35 40 45
 Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly Ala
 50 55 60
 Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His Phe
 65 70 75 80

10035212.010402

Leu Pro Met Val Val His Ser
85

<210> 77
<211> 219
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(219)

<400> 77
atg ggg aaa ctc tat ggc tca aaa gaa ttt aac aat gac tgt aag ctg 48
Met Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu
1 5 10 15
aag gag agg ata gag gaa aat gga tac aat acc tat gca tca ttt aac 96
Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn
20 25 30
tgg cag cat aat ggg agg caa atg tat gtg gca ttg aat gga aaa gga 144
Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly
35 40 45
gct cca agg aga gga cag aaa aca cga agg aaa aac acc tct gct cac 192
Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His
50 55 60
ttt ctt cca atg gtg gta cac tca tag 219
Phe Leu Pro Met Val Val His Ser
65 70

<210> 78
<211> 72
<212> PRT
<213> Homo sapiens

<400> 78
Met Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu
1 5 10 15
Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr Ala Ser Phe Asn
20 25 30
Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu Asn Gly Lys Gly
35 40 45
Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys Asn Thr Ser Ala His
50 55 60
Phe Leu Pro Met Val Val His Ser
65 70

<210> 79
<211> 357
<212> DNA
<213> Homo sapiens

<220>
<221> CDS

1005512.010403

<222> (1)..(357)

<400> 79

atg acc tgc cag gct ctg ggt cag gac atg gtt tct ccg gaa gct acc	48
Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr	
1 5 10 15	
aac tct tcc tct tcc tct ttc tct tcc ccg tct tcc gct ggt cgt cac	96
Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His	
20 25 30	
gtt cgt tct tac aac cac ctg cag ggt gac gtt cgt tgg cgt aaa ctg	144
Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu	
35 40 45	
ttc tct ttc acc aaa tac ttc ctg aaa atc gaa aaa aac ggt aaa gtt	192
Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val	
50 55 60	
tct ggg acc aag aag gag aac tgc ccg tac agc atc ctg gag ata aca	240
Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr	
65 70 75 80	
tca gta gaa atc gga gtt gtt gcc gtc aaa gcc att aac agc aac tat	288
Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr	
85 90 95	
tac tta gcc atg aac aag aag ggg aaa ctc tat ggc tca aaa gaa ttt	336
Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe	
100 105 110	
aac aat gac tgt aag ctg aag	357
Asn Asn Asp Cys Lys Leu Lys	
115	

<210> 80

<211> 119

<212> PRT

<213> Homo sapiens

<400> 80

Met Thr Cys Gln Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr	
1 5 10 15	
Asn Ser Ser Ser Ser Ser Phe Ser Ser Pro Ser Ser Ala Gly Arg His	
20 25 30	
Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu	
35 40 45	
Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val	
50 55 60	
Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr	
65 70 75 80	
Ser Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr	
85 90 95	
Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe	
100 105 110	

1005212 010402

Asn Asn Asp Cys Lys Leu Lys
115

<210> 81
<211> 276
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(276)

<400> 81
atg gct ggt cgt cac gtt cgt tct tac aac cac ctg cag ggt gac gtt 48
Met Ala Gly Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val
1 5 10 15

cgt tgg cgt aaa ctg ttc tct ttc acc aaa tac ttc ctg aaa atc gaa 96
Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu
20 25 30

aaa aac ggt aaa gtt tct ggg acc aag aag gag aac tgc ccg tac agc 144
Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser
35 40 45

atc ctg gag ata aca tca gta gaa atc gga gtt gtt gcc gtc aaa gcc 192
Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala
50 55 60

att aac agc aac tat tac tta gcc atg aac aag aag ggg aaa ctc tat 240
Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr
65 70 75 80

ggc tca aaa gaa ttt aac aat gac tgt aag ctg aag 276
Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys
85 90

<210> 82
<211> 92
<212> PRT
<213> Homo sapiens

<400> 82
Met Ala Gly Arg His Val Arg Ser Tyr Asn His Leu Gln Gly Asp Val
1 5 10 15

Arg Trp Arg Lys Leu Phe Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu
20 25 30

Lys Asn Gly Lys Val Ser Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser
35 40 45

Ile Leu Glu Ile Thr Ser Val Glu Ile Gly Val Val Ala Val Lys Ala
50 55 60

Ile Asn Ser Asn Tyr Tyr Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr
65 70 75 80

Gly Ser Lys Glu Phe Asn Asn Asp Cys Lys Leu Lys

1003512.010400

85

90

<210> 83
<211> 525
<212> DNA
<213> Homo sapiens

<400> 83
atgacctctc aggctctggg tcaggacatg gtttctccgg aagctaccaa ctcttctct 60
tctcttttct cttccccgtc ttccgctggg cgtcacgttc gttcttataa ccacctgcag 120
ggtgacgttc gttggcgtaa actgttctct ttaccaaact acttctgaa aatcgaaaaa 180
aacggtaaaag tttctgggac caagaaggag aactctccgt acagcatcct ggagataaca 240
tcagtagaaa tcggagtgtg tgcggtcaaa gccattaaca gcaactatta cttagccatg 300
aacaagaagg ggaaactcta tggctcaaaa gaatttaaca atgactgtaa gctgaaggag 360
aggatagagg aaaatggata caatacctat gcatcattta actggcagca taatgggagg 420
caaatgtatg tggcattgaa tggaaaagga gctccaagga gaggacagaa aacacgaagg 480
aaaaacacct ctgctcactt tcttccaatg gtggtacact catag 525

<210> 84
<211> 525
<212> DNA
<213> Homo sapiens

<400> 84
atgacctgcc aggctctggg tcaggacatg gtttctccgg aagctaccaa ctcttctct 60
tctcttttct cttccccgtc ttccgctggg cgtcacgttc gttcttataa ccacctgcag 120
ggtgacgttc gttggcgtaa actgttctct ttaccaaact acttctgaa aatcgaaaaa 180
aacggtaaaag tttctgggac caagaaggag aactctccgt acagcatcct ggagataaca 240
tcagtagaaa tcggagtgtg tgcggtcaaa gccattaaca gcaactatta cttagccatg 300
aacaagaagg ggaaactcta tggctcaaaa gaatttaaca atgactgtaa gctgaaggag 360
aggatagagg aaaatggata caatacctat gcatcattta actggcagca taatgggagg 420
caaatgtatg tggcattgaa tggaaaagga gctccaagga gaggacagaa aacacgaagg 480
aaaaacacct ctgctcactt tcttccaatg gtggtacact catag 525

<210> 85
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 85
ggaccctcat gacctctcag gctctgggt 29

<210> 86
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 86
aaggagaact ctccgtacag c 21

bioRxiv preprint doi: <https://doi.org/10.1101/014446>; this version posted April 14, 2014. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under aCC-BY-NC-ND 4.0 International license.

<210> 87
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 87
gctgtacggt ctgttctcct t 21

<210> 88
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 88
ggaccctcat gacctgccag gctctgggtc aggac 35

<210> 89
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 89
ctgcccgaagc ttattatgag tgtaccacca ttggaag 37

<210> 90
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 90
aaaggatcct gccaggctct gggtcaggac atg 33

<210> 91
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 91
gcggcacatg tcttacaacc acctgcaggg tg 32

<210> 92
<211> 28

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 92
gggccaagc ttatgagtgt accaccat 28

<210> 93
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 93
ccggcggatc ccatatgtct tacaaccacc tgcagg 36

<210> 94
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 94
ccggcggtag cttattatga gtgtaccacc attgg 35

<210> 95
<211> 426
<212> DNA
<213> Homo sapiens

<400> 95
atgtcttaca accacctgca ggggtgacgtt cgttggcgta aactgttctc tttcaccaaa 60
tactttctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atgggtcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcatt 300
aactggcagc ataatgggag gcaaatgtat gtggcattga atggaaaagg agctccaagg 360
agaggacaga aaacacgaag gaaaaacacc tctgtctact ttcttccaat ggtggtacac 420
tcataa 426

<210> 96
<211> 141
<212> PRT
<213> Homo sapiens

<400> 96
Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
1 5 10 15

Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
20 25 30

20440 "01040"

Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
35 40 45
Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60
Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80
Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95
Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110
Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys
115 120 125
Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 97
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 97
caaccacctg cagggtgacg 20

<210> 98
<211> 78
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 98
aacggtcgac aaatgtatgt ggcactgaac ggtaaagggtg ctccacgtcg tggtcagaaa 60
accggtcgta aaaacacc 78

<210> 99
<211> 76
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 99
gggcccagc ttaagagtgt accaccattg gcagaaagtg agcagaggtg tttttacgac 60
gggttttctg accacg 76

2040101225001

<210> 100
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:
 oligonucleotide

<400> 100
 gccacataca tttgtcgacc gtt 23

<210> 101
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:
 oligonucleotide

<400> 101
 gggcccaagc ttaagagtg 19

<210> 102
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:
 oligonucleotide

<400> 102
 gccacataca tttgtcgacc gtt 23

<210> 103
 <211> 90
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:
 oligonucleotide

<400> 103
 ctgcagggtg acgttcggtg gcgtaaactg ttctccttca ccaaatactt cctgaaaatc 60
 gaaaaaaacg gtaaagtctt tggtagcaag 90

<210> 104
 <211> 90
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:
 oligonucleotide

10035212.010402

<400> 104
agctttaaca gcaacaacac cgatttcaac ggaggtgatt tccaggatgg agtacgggca 60
gttttctttc ttggtaccag aaactttacc 90

<210> 105
<211> 90
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 105
ggtgttggtg ctgttaaagc tatcaactcc aactactacc tggctatgaa caagaaaggt 60
aaactgtacg gttccaaaga atttaacaac 90

<210> 106
<211> 100
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 106
gtcgaccggt gtgctgccag ttgaaggaag cgtaggtggt gtaaccgttt tcttcgatac 60
gttcttttcag ttacagtcg ttgttaaatt ctttgggaacc 100

<210> 107
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 107
gcggcgtcga ccgttggtgct gccag 25

<210> 108
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 108
gcggcctgca gggtgacgtt cgttgg 26

<210> 109
<211> 36
<212> DNA

10035212 "010402"

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
oligonucleotide

<400> 109

ccggcgatc ccatatgtct tacaaccacc tgcagg 36

<210> 110

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
oligonucleotide

<400> 110

cgcgcatat cttattaaga gtgtaccacc attg 34

<210> 111

<211> 426

<212> DNA

<213> Homo sapiens

<400> 111

atgtcttaca accacctgca gggtagcgtt cgttggcgta aactgttctc cttcaccaaa 60
tacttcctga aaatcgaaaa aaacggtaaa gtttctggta ccaagaaaga aaactgcccg 120
tactccatcc tggaaatcac ctccgttgaa atcgggtgtg ttgctgttaa agctatcaac 180
tccaactact acctggctat gaacaagaaa ggtaaacgtg acgggttcaa agaatttaac 240
aacgactgta aactgaaaga acgtatcgaa gaaaacgggt acaacaccta cgcttccttc 300
aactggcagc acaacggtcg acaaatgtat gtggcactga acggtaaagg tgctccacgt 360
cgtggtcaga aaaccgctcg taaaaacacc tctgctcact ttctgccaat ggtggtacac 420
tcttaa 426

<210> 112

<211> 141

<212> PRT

<213> Homo sapiens

<400> 112

Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
1 5 10 15

Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
20 25 30

Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
35 40 45

Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60

Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80

Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95

1003510102030405060708090100

Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110
Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys
115 120 125
Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 113
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 113
cgcgcccatg gctctgggtc aggacatg 28

<210> 114
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
oligonucleotide

<400> 114
gggcccaagc ttatgagtgt accaccat 28

<210> 115
<211> 516
<212> DNA
<213> Homo sapiens

<400> 115
atggctctgg gtcaagatat gggtttctcgg gaagctacca actcttcctc ttctctcttc 60
tcttccccgt cttccgctgg tcgtcacggt cgttcttaca accacctgca ggggtgacgtt 120
cgttgccgta aactgttctc ttccaccaa tacttctga aaatcgaaaa aaacggtaaa 180
gtttctggga ccaagaagga gaactgccg tacagcatcc tggagataac atcagtagaa 240
atcggagttg ttgccgtcaa agccattaac agcaactatt acttagccat gaacaagaag 300
gggaaactct atggctcaaa agaatttaac aatgactgta agctgaagga gaggatagag 360
gaaaatggat acaataccta tgcattcatt aactggcagc ataatgggag gcaaatgtat 420
gtggcattga atggaaaagg agctccaagg agaggacaga aaacacgaag gaaaaacacc 480
tctgtcact ttcttccaat ggtggtacac tcataa 516

<210> 116
<211> 171
<212> PRT
<213> Homo sapiens

<400> 116
Met Ala Leu Gly Gln Asp Met Val Ser Pro Glu Ala Thr Asn Ser Ser
1 5 10 15

204010 212500

Ser	Ser	Ser	Phe	Ser	Ser	Pro	Ser	Ser	Ala	Gly	Arg	His	Val	Arg	Ser
			20					25					30		
Tyr	Asn	His	Leu	Gln	Gly	Asp	Val	Arg	Trp	Arg	Lys	Leu	Phe	Ser	Phe
	35					40					45				
Thr	Lys	Tyr	Phe	Leu	Lys	Ile	Glu	Lys	Asn	Gly	Lys	Val	Ser	Gly	Thr
	50				55					60					
Lys	Lys	Glu	Asn	Cys	Pro	Tyr	Ser	Ile	Leu	Glu	Ile	Thr	Ser	Val	Glu
	65			70					75						80
Ile	Gly	Val	Val	Ala	Val	Lys	Ala	Ile	Asn	Ser	Asn	Tyr	Tyr	Leu	Ala
			85					90						95	
Met	Asn	Lys	Lys	Gly	Lys	Leu	Tyr	Gly	Ser	Lys	Glu	Phe	Asn	Asn	Asp
		100						105					110		
Cys	Lys	Leu	Lys	Glu	Arg	Ile	Glu	Glu	Asn	Gly	Tyr	Asn	Thr	Tyr	Ala
		115					120					125			
Ser	Phe	Asn	Trp	Gln	His	Asn	Gly	Arg	Gln	Met	Tyr	Val	Ala	Leu	Asn
	130					135					140				
Gly	Lys	Gly	Ala	Pro	Arg	Arg	Gly	Gln	Lys	Thr	Arg	Arg	Lys	Asn	Thr
	145				150					155					160
Ser	Ala	His	Phe	Leu	Pro	Met	Val	Val	His	Ser					
				165					170						

<210> 117
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

<400> 117
 gcgggcacatg tcttacaacc acctgcaggg tg 32

<210> 118
 <211> 75
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

<400> 118
 ctgcccaagc ttttatgagt gtaccacat tggaagaaag tgagcagagg tgtttttttc 60
 tctgtgtttc tgtcc 75

<210> 119
 <211> 426
 <212> DNA
 <213> Homo sapiens

<400> 119

10035212 010406


```

atgtcttaca accacctgca ggggtgacgtt cgttggcgta aactgttctc tttcaccaaa 60
tacttctctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atgggtcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcatt 300
aactggcagc ataatgggag gcaaattgat gtggcattga atggaaaagg agctccaagg 360
agaggacaga aaacacgaga aaaaaacacc tctgtctact ttcttccaat ggtggtacac 420
tcatag

```

<210> 120
 <211> 141
 <212> PRT
 <213> Homo sapiens

<400> 120
 Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
 1 5 10 15
 Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
 20 25 30
 Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
 35 40 45
 Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
 50 55 60
 Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
 65 70 75 80
 Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
 85 90 95
 Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
 100 105 110
 Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Glu Lys
 115 120 125
 Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
 130 135 140

<210> 121
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

<400> 121
 gcggcacatg tcttacaacc acctgcaggg tg 32

<210> 122
 <211> 75
 <212> DNA
 <213> Artificial Sequence
 <220>

<223> Description of Artificial Sequence: primer

<400> 122
ctgccaagc ttttatgagt gtaccacat tggaagaaag tgagcagagg tgtttttctg 60
tcgtgttttc tgtcc 75

<210> 123
<211> 426
<212> DNA
<213> Homo sapiens

<400> 123
atgtcttaca accacctgca ggggtgacgtt cgttggcgta aactgttctc tttcaccaaa 60
tacttcctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atggctcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcatt 300
aactggcagc ataatgggag gcaaatgtat gtggcattga atggaaaagg agctccaagg 360
agaggacaga aaacacgaca gaaaaacacc tctgtcact ttcttccaat ggtggtacac 420
tcatag 426

<210> 124
<211> 141
<212> PRT
<213> Homo sapiens

<400> 124
Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
1 5 10 15
Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
20 25 30
Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
35 40 45
Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60
Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80
Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95
Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110
Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Gln Lys
115 120 125
Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 125
<211> 32
<212> DNA
<213> Artificial Sequence

204070"225E001

<220>

<223> Description of Artificial Sequence: primer

<400> 125

gcggcacatg tcttacaacc acctgcaggg tg

32

<210> 126

<211> 84

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 126

ctgcccgaagc ttttatgagt gtaccacccat tggaagaaag tgagcagagg tgtttttccct 60
tcgtgtttcc tgcctctcc ttgg 84

<210> 127

<211> 426

<212> DNA

<213> Homo sapiens

<400> 127

atgtctttaca accacctgca ggggtgacgtt cgttggcgta aactgtttctc tttcaccaaaa 60
tactttcctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atggctcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcattt 300
aactggcagc ataatgggag gcaaattgtat gtggcattga atggaaaagg agctccaagg 360
agaggacagg aaacacgaag gaaaaacacc tctgctcact ttcttccaat ggtggtacac 420
tcatag 426

<210> 128

<211> 141

<212> PRT

<213> Homo sapiens

<400> 128

Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
1 5 10 15

Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
20 25 30

Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
35 40 45

Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60

Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80

Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95

Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110

204070 212500

Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Glu Thr Arg Arg Lys
115 120 125

Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 129

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 129

gcggcacatg tcttacaacc acctgcaggg tg 32

<210> 130

<211> 84

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 130

ctgccaagc ttttatgagt gtaccacccat tggaagaaag tgagcagagg tgtttttcc 60
tcgtgtctgc tgtcctctcc ttgg 84

<210> 131

<211> 426

<212> DNA

<213> Homo sapiens

<400> 131

atgtcttaca accacctgca gggtgacgtt cgttggcgta aactgttctc tttcaccaaa 60
tacttctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atggctcaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcatt 300
aactggcagc ataattggag gcaaatgtat gtggcattga atggaaaagg agctccaagg 360
agaggacagc agacacgaag gaaaaacacc tctgctcact ttcttccaat ggtggtacac 420
tcatag 426

<210> 132

<211> 141

<212> PRT

<213> Homo sapiens

<400> 132

Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
1 5 10 15

Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
20 25 30

Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
35 40 45

1005212.010400

Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60
Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80
Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95
Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110
Leu Asn Gly Lys Gly Ala Pro Arg Arg Gly Gln Gln Thr Arg Arg Lys
115 120 125
Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 133
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 133
gcggcacatg ttttacaacc acctgcaggg tg 32

<210> 134
<211> 93
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 134
ctgcccgaagc ttttatgagt gtaccacat tggaagaaag tgagcagagg tgtttttct 60
tcgtgttttc tgccttccc ttggagctcc ttt 93

<210> 135
<211> 426
<212> DNA
<213> Homo sapiens

<400> 135
atgtcttaca accacctgca gggtagcgtt cggtggcgta aactgttctc tttcaccaaa 60
tacttcctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
agcaactatt acttagccat gaacaagaag gggaaactct atgggtcaaa agaatttaac 240
aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcattt 300
aactggcagc ataatgggag gcaaatgtat gtggcattga atggaaaagg agctccaagg 360
gaaggacaga aaacacgaag gaaaaacacc tctgtcact ttcttccaat ggtggtacac 420
tcatag 426

<210> 136
<211> 140

10033312.010403

<213> Homo sapiens

Met Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe Ser
1 5 10 15

Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser Gly
20 25 30

Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser Val
35 40 45

Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr Leu
50 55 60

Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn Asn
65 70 75 80

Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr Tyr
85 90 95

Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala Leu
100 105 110

Asn Gly Lys Gly Ala Pro Arg Glu Gly Gln Lys Thr Arg Arg Lys Asn
115 120 125

Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 137

$\langle 211 \rangle$ 32

<212> DNA

<213> Artificial Sequence

 $\langle 220 \rangle$

<223> Description of Artificial Sequence: primer

<400> 137

gcggcacatg tcttacaacc acctgcaggg tg

32

<210> 138

<211> 93

<212> DNA

<213> Artificial Sequence

 $\langle 220 \rangle$

<223> Description of Artificial Sequence: primer

<400> 138

```
ctgcccgaagc ttttatgagt gtaccaccat tggagaagaa tgagcagagg tgttttttct 60
tqgtgttttc tgtccctgcc ttggagctcc ttt                                     93
```

<210> 139

<211> 426

<212> DNA

<213> Homo sapiens

```
<210> 140
<211> 141
<212> PRT
<213> Homo sapiens
```

```
<210> 141
<211> 32
<212> DNA
<213> Artificial Sequence
```

<400> 141
gcggcacatg tcttacaacc acctgcaggg tg 32

```
<210> 142
<211> 21
<212> DNA
<213> Artificial Sequence
```

<220>
 <223> Description of Artificial Sequence: primer
 <400> 142
 ttgaatggag aaggagctcc a 21

<210> 143
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer
 <400> 143
 tggagctcct tctccattca a 21

<210> 144
 <211> 33
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer
 <400> 144
 ctgcccgaagc ttttatgagt gtaccacccat tgg 33

<210> 145
 <211> 426
 <212> DNA
 <213> Homo sapiens

<400> 145
 atgtctttaca accacctgca ggggtgacgtt cggtggcgta aactgtttctc tttcaccaaaa 60
 tacttctctga aaatcgaaaa aaacggtaaa gtttctggga ccaagaagga gaactgcccg 120
 tacagcatcc tggagataac atcagtagaa atcggagttg ttgccgtcaa agccattaac 180
 agcaactatt acttagccat gaacaagaag gggaaactct atggctcaa agaatttaac 240
 aatgactgta agctgaagga gaggatagag gaaaatggat acaataccta tgcattcattt 300
 aactggcagc ataatgggag gcaaatgtat gtggcattga atggagaagg agctccaagg 360
 agaggacaga aaacacgaag gaaaaacacc tctgctcact ttcttccaat ggtggtacac 420
 tcatag 426

<210> 146
 <211> 141
 <212> PRT
 <213> Homo sapiens

<400> 146
 Met Ser Tyr Asn His Leu Gln Gly Asp Val Arg Trp Arg Lys Leu Phe
 1 5 10 15
 Ser Phe Thr Lys Tyr Phe Leu Lys Ile Glu Lys Asn Gly Lys Val Ser
 20 25 30
 Gly Thr Lys Lys Glu Asn Cys Pro Tyr Ser Ile Leu Glu Ile Thr Ser
 35 40 45

304070-2125007

Val Glu Ile Gly Val Val Ala Val Lys Ala Ile Asn Ser Asn Tyr Tyr
50 55 60

Leu Ala Met Asn Lys Lys Gly Lys Leu Tyr Gly Ser Lys Glu Phe Asn
65 70 75 80

Asn Asp Cys Lys Leu Lys Glu Arg Ile Glu Glu Asn Gly Tyr Asn Thr
85 90 95

Tyr Ala Ser Phe Asn Trp Gln His Asn Gly Arg Gln Met Tyr Val Ala
100 105 110

Leu Asn Gly Glu Gly Ala Pro Arg Arg Gly Gln Lys Thr Arg Arg Lys
115 120 125

Asn Thr Ser Ala His Phe Leu Pro Met Val Val His Ser
130 135 140

<210> 147

<211> 3974

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: pHE4-5 vector

<400> 147

ggtacctaag	tgagtagggc	gtccgatcga	cggacgcctt	ttttttgaat	tcgtaatcat	60
ggtcatagct	gtttcctgtg	tgaaattggt	atccgctcac	aattccacac	aacatacgag	120
ccggaagcat	aaagtgtaaa	gcctgggggtg	cctaattgagt	gagctaactc	acattaattg	180
cgttgcgctc	actgcccgct	ttccagtcgg	gaaacctgtc	gtgccagctg	cattaatgaa	240
tcggccaacg	cgcggggaga	ggcggtttgc	gtattgggcg	ctcttcogct	tcctcgctca	300
ctgactcgct	gcgctcggtc	gttcgggtgc	ggcgagcggt	atcagctcac	tcaaaggcgg	360
taatacgggt	atccacagaa	tcaggggata	acgcaggaaa	gaacatgtga	gcaaaaggcc	420
agcaaaaggc	caggaaccgt	aaaaaggccg	cgttgctggc	gtttttocat	aggctccgcc	480
cccctgacga	gcatacaaaa	aatcgacgct	caagtacagag	gtggcgaaac	ccgacaggac	540
tataaagata	ccaggcggtt	ccccctggaa	gctccctcgt	gcgctctcct	gttccgacct	600
tgccgcttac	cggatacctg	tcgcgctttc	tcccttcggg	aagcgtggcg	ctttctcata	660
gctcacgctg	taggtatctc	agttcgggtg	aggctggtcg	ctccaagctg	ggctgtgtgc	720
acgaaccccc	cggtcagccc	gaccgctgcg	ccttatccgg	taactatcgt	cttgagtcga	780
acccggttaag	acacgactta	tcgccactgg	cagcagccac	tggtaacagg	attagcagag	840
cgagggtatgt	aggcggtgct	acagagttct	tgaagtgggtg	gcctaactac	ggctacacta	900
gaagaacagt	atgttggtatc	tgcgctctgc	tgaagccagt	taccttcgga	aaaagagttg	960
gtagctcttg	atccggcaaa	caaaccaccg	ctggtagcgg	tggttttttt	gtttgcaagc	1020
agcagattac	gcgcagaaaa	aaaggatctc	aagaagatcc	tttgatcttt	tctacggggg	1080
ctgacgctca	gtggaacgaa	aactcacggt	aagggatttt	ggtcattgaga	ttatcgtcga	1140
caattcgcgc	gcgaaggcga	agcggcatgc	atttacgttg	acaccatcga	atggtgcaaa	1200
acctttcgcg	gtatggcatg	atagcgcccc	gaagagagtc	aattcagggt	ggtgaatgtg	1260
aaaccagtaa	cgttatacga	tgtgcgagag	tatgccggtg	tctcttatca	gaccgtttcc	1320
cgcggtggta	accaggccag	ccacgtttct	gcgaaaacgc	gggaaaaagt	ggaagcggcg	1380
atggcggagc	tgaattacat	tcccaaccgc	gtggcacaac	aactggcggg	caaacagtcg	1440
ttgctgattg	gcggtgccac	ctccagtcctg	gccctgcacg	cgccgctcgca	aattgtcgcg	1500
gcgattaaat	ctcgcgccga	tcaactgggt	gccagcgtgg	tgggtgctgat	ggtagaacga	1560
agcggcgctg	aagcctgtaa	agcggcggtg	cacaatcttc	tcgcgcaacg	cgtcagtggtg	1620
ctgatcatta	actatccgct	ggatgaccag	gatgccattg	ctgtggaagc	tgccctgcaact	1680
aatgttccgg	cgttatttct	tgatgtctct	gaccagacac	ccatcaacag	tattattttc	1740
tccatgaag	acggtagcgc	actggcggtg	gagcatctgg	tcgcattggg	tcaccagcaa	1800
atcgcgctgt	tagcgggccc	attaagttct	gtctcggcgc	gtctgctgct	ggctggctgg	1860
cataaatatc	tactcgcaa	tcaaatccag	ccgatagcgg	aacgggaagg	cgactggagt	1920
gccatgtccg	gttttcaaca	aaccatgcaa	atgctgaatg	agggcatcgt	tcccactcgc	1980
atgctgggtg	ccaacgatca	gatggcgctg	ggcgcaatgc	gcgccattac	cgagtcgggg	2040

```

ctgcgcgttg gtgcggatat ctcggttagtg ggatacgacg ataccgaaga cagctcatgt 2100
tatatccgcg cggttaaccac catcaaacag gattttcgcc tgctggggca aaccagcgtg 2160
gaccgcttgc tgcaactctc tcaggggccag gcggtgaagg gcaatcagct gttgcccgtc 2220
tacttggtga aaagaaaaac caccctggcg cccaatacgc aaaccgcctc tccccgcgcg 2280
ttggccgatt cattaatgca gctggcacga caggtttccc gactggaaaag cgggcagtga 2340
gcgcaacgca attaatgtaa gtttagcgca attgtcgacc aaagcggcca tcgtgcctcc 2400
ccactcctgc agttcggggg catggatgcg cggatagccg ctgctggttt cctggatgcc 2460
gacggatttg cactgccggt agaactcgcg gaggtcgtcc agcctcaggc agcagctgaa 2520
ccaactcgcg aggggatcga gcccggggtg ggcgaaagac tccagcatga gatccccgcg 2580
ctggaggatc atccagccgg cgtcccggaa aacgattccg aagcccaacc tttcatagaa 2640
ggcgccggtg gaatcgaaat ctcgatgatg caggttgggc gtcgcttggt cggtcatttc 2700
gaaccccaga gtcccgcctc gaagaactcg tcaagaaggc gatagaaggc gatgcgctgc 2760
gaatcgggag cggcgatacc gtaaagcacg aggaagcggc cagcccattc gccgccaagc 2820
tcttcagcaa tatcacgggt agccaacgct atgtcctgat agcggtcctg cacaccagc 2880
cggccacagt cgatgaatcc agaaaagcgg ccattttcca ccatgatatt cggcaagcag 2940
gcatcgccat gggtcacgac gagatcctcg ccgtcgggca tgcgcgcctt gagcctggcg 3000
aacagttcgg ctggcgcgag ccctgatgc tcttcgtcca gatcatcctg atcgacaaga 3060
ccggttcca tccgagtagc tgctcgctcg atgcgatgtt tcgcttggtg gtogaatggg 3120
caggtagccg gatcaagcgt atgcagccgc cgcattgcat cagccatgat ggatactttc 3180
tcggcaggag caaggtaga tgacaggaga tccgtgcccg gcacttcgcc caatagcagc 3240
cagtccttcc cgccttcagt gacaacgtcg agcacagctg cgcaaggaaac gcccgctcgtg 3300
gccagccacg atagccgcgc tgctcgtcc tgcatgtcat tcagggcacc ggacaggtcg 3360
gtcttgacaa aaagaaccgg gcgcccctgc gctgacagcc ggaacacggc ggcatcagag 3420
cagccgattg tctgttgtgc ccagtcatag ccgaatagcc tctccacca agcgcccgga 3480
gaacctgcgt gcaatccatc ttgttcaatc atgcgaaacg atctcatcc tgtctcttga 3540
tcagatcttg atccccctgc ccacagatc cttggcggca agaaagccat ccagtttact 3600
ttgcagggtt tcccaacctt accagagggc gcccagctg gcaattccgg ttcgcttgct 3660
gtccataaaa ccgcccagtc tagctatcgc catgtaagcc cactgcaagc tacctgcttt 3720
ctctttgcgc ttgcgttttc cctgtgccag atagcccagt agctgacatt catccggggg 3780
cagcaccggt tctgcggact ggctttctac gtgttccgct tcttttagca gcccttgccg 3840
cctgagtgct tgcggcagcg tgaagcttaa aaaactgcaa aaaatagttt gacttgtgag 3900
cggataacaa ttaagatgta cccaattgtg agcggataac aatttcacac attaaagagg 3960
agaaattaca tatg                                     3974

```

<210> 148
 <211> 112
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: pHE4-5
 promoter sequence

```

<400> 148
aagcttaaaa aactgcaaaa aatagtttga cttgtgagcg gataacaatt aagatgtacc 60
caattgtgag cggataacaa ttccacacat taaagaggag aaattacata tg 112

```

<210> 149
 <211> 106
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

```

<400> 149
gagcgcggat ccgccacat gaaggtctcc gtggctgcc tctcctgcct catgcttggt 60
actgcccttg gatctcaggc cagctacaat caccttcaag gagatg 106

```

```
<210> 150
<211> 36
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: primer

<400> 150
gagcgcggat ccctatgagt gtaccaccat tggaag 36

```
<210> 151
<211> 32
<212> DNA
<213> Artificial Sequence
```

```
<220>
<223> Description of Artificial Sequence: primer
```

<400> 151
ccggccatat gcgtaaactg ttctctttca cc 32

```
<210> 152
<211> 35
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: primer

<400> 152
ccggcggtac cttattatga gtgtaccacc attgg 35

```
<210> 153
<211> 32
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: primer

<400> 153
gatgcgcata tggctggctg tcacgttcgt tc 32

<210> 154
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 154
gatcgcggta ccttattatg agtgtaccac cattggaag 39

$$\begin{array}{ll} \langle 210 \rangle & 155 \\ \langle 211 \rangle & 32 \end{array}$$

<220>
<223> Description of Artificial Sequence: primer

```
<210> 156
<211> 39
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: primer

```
<210> 157
<211> 32
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: primer

```
<210> 158
<211> 39
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: primer

```
<210> 159
<211> 32
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: primer

```
<210> 160
<211> 39
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of Artificial Sequence: primer

<400> 160
gatcgcggtta ccttattatg agtgtaccac cattggaag 39

<210> 161
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 161
gatcgcggtat ccgccaccat gtggaaatgg atactgacac attgtgc 47

<210> 162
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 162
gatcgctcta gattatgagt gtaccaccat tggaagaaag 40

<210> 163
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 163
gatcgcggtat ccgccaccat gtggaaatgg atactgacac attgtgc 47

<210> 164
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 164
gatcgctcta gattatgagt gtaccaccat tggaagaaag 40

<210> 165
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 165
gatcgcggtat ccgccaccat gtggaaatgg atactgacac attgtgc 47

<210> 166
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 166
gatcgctcta gattatgagt gtaccaccat tggaagaaag 40

<210> 167
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 167
gatcgcggtat ccgccaccat gtggaaatgg atactgacac attgtgc 47

<210> 168
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 168
gatcgctcta gattatgagt gtaccaccat tggaagaaag 40

<210> 169
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 169
gatcgccata tggctggtcg tcacgttcgt tc 32

<210> 170
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 170
gatcgcggtat ccttattatg agtgtaccac cattggaag 39

<210> 171
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 171
gatcgccata tggctggtcg tcaogttcgt tc 32

<210> 172
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 172
gatcgcggtta cttattatg agtgtaccac cattggaag 39

<210> 173
<211> 456
<212> DNA
<213> Escherichia coli

<400> 173
catatggctg gtcgtcacgt tcgttcttac aaccacctgc aggggtgacgt tcgttggcgt 60
aaactgttct ctttcaccaa atacttcctg aaaatcgaaa aaaacggtaa agtttctggg 120
accaagaagg agaactgcc gtacagcatc ctggagataa catcagtaga aatcggagtt 180
gttgccgtca aagccattaa cagcaactat tacttagcca tgaacaagaa ggggaaactc 240
tatggctcaa aagaatttaa caatgactgt aagctgaagg agaggataga ggaaaatgga 300
tacaatacct atgcatcatt taactggcag cataatggga ggcaaatgta tgtggcattg 360
aatggaaaag gagtccaag gagaggacag aaaacacgaa ggaaaaaacac ctctgctcac 420
tttcttccaa tgggtgtaca ctcataataa ggtacc 456

<210> 174
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 174
gactacatat ggctggtcgt cacgttcggt cttacaacca cctgcagg 48

<210> 175
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 175

47

<211> 447

<213> Escherichia coli

atggctggtc	gtcacgttcg	ttcttacaac	cacctgcagg	gtgacgttcg	ttggcgtaaa	60
ctgttctctt	tcaccaaata	cttctgaaa	atcgaaaaga	acggtaaagt	ttctggtacc	120
aagaaagaaa	actgccogta	ctctatcctg	gaaatcacct	ccgttgaaat	cgggtgttga	180
gccgttaaag	ccatcaactc	caactattac	ctggccatga	acaaaaaggg	taaactgtac	240
ggctctaaag	aattccaaca	cgactgc aaa	ctgaaagaac	gtatcgaaga	gaacggttac	300
aacacctagc	cctccttcaa	ctggcagcac	aacggctcgtc	agatgtacgt	tgcactgaac	360
ggtaaagcgc	ctccgcgtcg	cggtcagaaa	accgcgcgca	aaaacacctc	tgctcacttc	420
ctgccgatgg	ttgtacactc	ataataa				447